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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _30 November 2009_.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-25_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-25_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _12/16/09_.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendments/Remarks

1.   Applicant's arguments filed on 3/16/2009 with respect the rejection(s) of claim(s) 1-25

under 35 U.S.C. 103(a) are fully considered, but are not persuasive.

2.   Applicant argues:

a) "A combination of the cited references fails to show a particular router that is associated with an actual

time taken for a previous data packet to travel to a previous destination indicated by the previous data packets. In

addition, the combination of the references fails to show that this actual time is a shortest time among all times

associated with the routers." (3rd paragraph from bottom, page 12);

b) "the Office Action addresses the unclaimed alternative language of "selecting, from a set of routers, a

particular router that is associated with a first actual path is a shortest path among all paths associated with routers in

the set of routers", "wherein the first actual path has been updated with a previous actual path taken for a previous

data packet to travel to a previous destination indicated by the previous data packet." These phrases upon which the

examination was performed do not appear in Claim 1." (2nd paragraphs from bottom, page 12);

c) "the Office Action substitutes the claim term "actual time for a data packet to travel to a destination"

with "an actual path," which does not appear in Claim 1" (last paragraphs of page 12 extending to page

13);

d) "The Office Action asserts that RFC 2676 at Section 1.2 page 5 line 8 "teaches the shortest path in

terms of traveling time." Respectfully, this is incorrect." (last paragraph of page 14);

e) "Caro's data model is probabilistic. As shown in FIG. 1 on page 325, a network node maintains a

routing table and a local traffic statistics table. Caro's probabilistic information, i.e., the local traffic statistics table,

only stores means and variances, as indicated by expression (1) on page 326. The actual time of a data packet is only

used to compute the means and variances in expression (1). Only the computed statistical results are stored in the

local traffic statistics table. There is neither a need nor a disclosure in Caro to store actual times of any data packets,

as argued by the Office Action. The means and variances in Caro's probabilistic information cannot be used to find a

router associated with an actual time for a data packet to travel to a destination, as explicitly claimed." (3rd

paragraph of page 21).

In response, Examiner respectfully disagrees:

a) Caro in view of RFC 2676 discloses every limitation of the claim, as shown in the

Office Action. The term "actual time" is not defined in Specification. Examiner interprets it as a

time that is spent on traveling along a particular path.

b) As stated in Office Action that Caro teaches shortest path and RFC 2676 teaches the

shortest path is measured in time. The combination of Caro and RFC 2676 teach all the

limitations of claim. Note that this is a 103 rejection, not a 102 rejection.

c) The term "actual time" is not defined in Specification. Examiner interprets it as a time

that is spent on traveling along a particular path, which Examiner calls as the actual path, which

is clear and reasonable.

d) RFC 2676 disclose OSPF routing path finding using QoS parameters including delay

("minimize delay", 2nd paragraph of Section 3.2, page 18) as the criterion for the shortest path.

OSPF protocol maintains a routing table from which the shortest path is found based on delay,

which is interpreted as the shortest path in terms of time.

e) Caro teaches building and updating a routing table based on a probabilistic model.

After the routing table is built or updated, a shortest path can be found between any two nodes,

which does not violate Caro's critical probabilistic model in any way because Caro's model is

used in **building** or **updating** the routing table, **not in finding** the shortest path.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   **Claims 1-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Teruhi et al

(US 20030072269, hereinafter **Teruhi**, which includes IETF standard for RTP, RFC 1889, as

cited by Teruhi in [0045]) in view of Apostolopoulos, et al., INTF RFC 2676 "QoS Routing

Mechanisms and OSPF Extensions", August 1999 (hereinafter **RFC 2676**)

For **claim 1**, Teruhi discloses a method of updating a routing table ("routing

table", [0053]; or suggested by OSPF, [0003], which updates a routing table),

comprising the computer-implemented steps of:

selecting, from a set of routers, a particular router that is associated with a first

actual path is a shortest path among all paths associated with routers in the set of

routers (selecting a router from a set of routers associated with link 31-33 which has a

shortest path to a destination, as shown in FIG. 18, that has the shortest path from the

source node 11 to the destination node 12);

wherein the first actual path has been updated with a previous actual path taken

for a previous data packet to travel to a previous destination indicated by the previous

data packet (routing table is updated based on previous traffic, [0007]);

sending a first data packet (first RTCP-SR sent from node 11 to node 12 in FIG.

9) to the particular router;

receiving a second data packet (first RTCP-RR sent from node 12 to node 11 in FIG. 9) that indicates an second amount of time taken for a destination back to the sending router (the time between the first RTCP-RR packet is sent from Node 12 and the time it arrives at Node 11, FIG. 9, as disclosed by Section 6.3.2 in page 28 of RFC 1889);

wherein the destination indicated by the first data packet is the same as the previous destination indicated by the previous data packet (FIG. 10, RTCP-RR packet is sent to the destination following a path in the routing table built based on the previous data packet);

wherein the second data packet is sent from the destination indicated by the first data packet (FIG. 9, where RTCP-RR is sent from the destination of RTCP-SR);

wherein the method is performed by one or more computing devices (the router shown in FIG. 18).

Teruhi **is silent on** the following:

the shortest path is measured in terms of a shortest time (a first actual time);

updating the shortest time based on the second time (the trip time of the second packet from the destination to the sending router); and

updating the routing table based on information contained in the second data packet.

In the same field of endeavor (routing), RFC2676 teaches finding the shortest path (OSPF, page 1) in terms of traveling time (delay, line 8 of first paragraph in Section 1.2, Page 5, which is the time difference between the time that a RTCP packet leaving a node A and the time the packet arrives a node B, and is equivalent to the actual

traveling time from the node A to the node B) from the routing table that are updated

based on the received packets ("the QoS routing table that gets built as the algorithm

progresses ... at each (hop count) iteration, intermediate results are recorded in a QoS

routing table", 2nd paragraph, page 12), which is the shortest time of the all the previous

packets traveled from the set of nodes to the destination node.

Therefore, it would have been obvious to a person of ordinary skill in the art at

the time of the invention to combine Teruhi with RFC2676 to choose the shortest path

(in term of traveling time) and update the first (shortest) time and the routing table

based on the information from the second packet for the benefit of efficiency of network

because they are analogous.

As to **claim 2**, Teruhi in view of RFC 2676 discloses the method of Claim 1,

further comprising: updating a path associated with both the destination and the

particular router (by considering the particular router as the sending router in claim 1).

As to **claims 3** and **6**, Teruhi in view of RFC 2676 discloses the method of Claim

1; Teruhi **is silent on** the second data packet information including the bandwidth

available on a path taken by the second data packet.

RFC 2676 teaches the routing packet containing QoS information ("QoS routing",

1st paragraph of Page 5), including bandwidth information ("available bandwidth", Line 7

of Section 1.2, Page 5).

Therefore, it would have been obvious to a person of ordinary skill in the art at

the time of the invention to include bandwidth information in the second packet for the

benefit of efficiency of providing better routing options.

As to **claims 4** and **7**, Teruhi in view of RFC 2676 discloses the method of Claim 1, whether a path taken by the first data packet is feasible (a path found based on updated routing table is feasible).

As to **claim 5**, Teruhi in view of RFC 2676 discloses the method of Claim 1, further comprising: updating, based on information contained in the second data packet, a list of routers that indicates all routers in a path taken by the first data packet to a router that sent the first data packet to a present router (This is equivalent to finding the shortest path based on the updated routing table with the information of the second data packet).

5.   **Claims 8** and **18-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over RFC 1247 "OSPF Version 2", July 1991 (hereinafter RFC 1247) in view of RFC 2676.

For **claims 8** and **18-20**, RFC 1247 discloses a method, a computer storage medium, an apparatus for updating a routing table ("a routing table", page 1, 2nd paragraph), comprising:

A network interface (the network interface of the router OSPF router, page 1, 2nd paragraph) that is coupled to a data network for receiving one or more packet flows therefrom; a processor (CPU of "OSPF router", page 1, 2nd paragraph) executing instructions

for each neighbor router in a set of neighbor routers (neighboring routers, page 4), selecting a shortest path to a specified destination via a set of neighbor routers (shortest paths, 3rd paragraph of 1.1, page 2);

wherein the shortest path has been updated with a previous data packet to travel to the specified destination (Link State Update, table 8, page 26, where the routing is updated based previous routing data packets) ;

send a first data packet to the specified destination (sending Link State Request packet to the destination, 3rd paragraph of page 74);

receiving a second data packet from the specified destination (receiving sending Link State Request packet from the destination, 3rd paragraph of page 74);

wherein the second data packet is sent from the destination (FIG. 10, where RTCP-RR is sent from the destination of RTCP-SR);

updating the routing table based on information contained in the second data packet ("updating the necessary part of its database", 3rd paragraph of page 74).

RFC 1247 **is silent on** the measurement parameter for the shortest path in routing table is the time (or delay) for a packet to travel from a source router to a destination router.

RFC 2676 discloses using delay (line 8 of Section 1.2, Page 5) as one of QoS parameters for routing measurement (the shortest delay includes the information of delay times of all the previous packets to the destination), which are used to the updating routing table. RFC 2676 teaches enhancement of OSPFv2 by RFC 1247. It would be obvious for one skilled in the art to combine RFC 1247 with RFC 2676 to use time delay in the routing table, and update the routing table for the shortest path in term of delay time between two routers.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to using delay time as routing measurement parameters to update routing table.

6.   **Claim 1-25** are rejected under 35 U.S.C. 103(a) as being 103(a) as being unpatentable over Gianni Di Caro et al., "AntNet: Distributed Stigmergetic Control for Communications Networks", Journal of Artificial Intelligence Research, 12/98 (hereinafter Caro) in view of RFC 2676 (which includes the recited RFC 1247).

For **claim 1**, Caro discloses a method of updating a routing table ("the routing table", page 327, step 3), comprising the computer-implemented steps of:

sending a first data packet from a sending router to a given destination via a particular router so that the packet arrives at the destination (sending forward ant, step 1 of page 326, line 1-3); wherein the first time has been updated with a previous time taken for a previous data packets (the routing table is built based on previous routing data packets);

receiving a second data packet that indicates an second amount of time from taken for the destination back to the sending router (receiving backward ant, step 5 of page 327);

selecting the path according to a criterion that the first packet is predicted to reach the destination, wherein the second data packet is sent from the destination indicated by the first data packet ("The backward ant takes the same path as that of its corresponding forward ant, but in the opposite direction", step 6, page 328);

updating the shortest time based on the second time ("updates .. the traffic M_k",

step 7, page 328 in view of "The model M maintains absolute distance/time estimates",

3rd paragraph, page 326); and

updating the routing table based on information contained in the second data

packet ("updates … the routing table", step 7, page 328-329);

wherein the method is performed by one or more computing devices (the routers

on the path upon which forward and backward ants travel).

Caro **is silent on** the criterion for the shortest path is based on the shortest time

(the first time, which is a shortest time that the first packet is predicted to reach the

destination);

In the same field of endeavor (routing), RFC2676 teaches routing the shortest

path in term of traveling time (delay, line 8 of first paragraph in Section 1.2, Page 5).

Therefore, it would have been obvious to a person of ordinary skill in the art at

the time of the invention to combine Caro with RFC 2676 to choose the shortest path (in

term of traveling time) and update the first (shortest) time and the routing table based on

the information from the second packet for the benefit of efficiency of network because

they are analogous.

As to **claim 2**, Caro in view of RFC 2676 discloses the method of Claim 1, Caro

further discloses the method comprising: updating a path associated with both the

destination and the particular router ("updates … the routing table", step 7, page 328).

As to **claims 3** and **6**, Caro in view of RFC 2676 discloses the method of Claim

1, but are silent on the second data packet information including the bandwidth

available on a path taken by the second data packet.

RFC 2676 teaches the routing packet containing QoS information ("to support QoS", Line 3 of Section 1.2, Page 5), particularly bandwidth information ("available bandwidth", Line 7 of Section 1.2, Page 5).

One skilled in the art would have been motivated to apply the teaching by RFC 2676 to the second packet to provide additional information for better routing options. Furthermore, OSPF technology taught by 2676 is cited by the applicant in the disclosure.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to include bandwidth information in the second packet for the benefit of efficiency of providing better routing options.

As to **claims 4** and **7**, Caro and RFC 2676 disclose the method of Claim 1, whether a path taken by the first data packet is feasible (a path predicted to take a shortest time from the source node to the destination node is always feasible).

As to **claim 5**, Caro and RFC 2676 disclose the method of Claim 1, Caro further discloses the method comprising: updating, based on information contained in the second data packet, a list of routers that indicates all routers in a path taken by the first data packet to a router that sent the first data packet to a present router ("updates … the routing table", step 7, page 328-329).

For **claim 8** and **18-20**, Caro discloses a method, an apparatus for updating a routing table (steps 1-7, page 326-330), comprising:

a network interface (the network interface of the router holding the routing table) that is coupled to a data network for receiving one or more packet flows therefrom; a processor (CPU of the router holding the routing table) executing instructions

for each neighbor router in a set of neighbor routers (suggested by "every

network node", line 1 of step 1, page 326), selecting a path to a specified destination

via a set of neighbor routers (line 1-2 of step 3 and step 5, page 327);

wherein the shortest path has been updated with a previous time taken for a

previous data packet to travel to the specified destination (line 5-30 of page 331,

determining is based on M=Local traffic model and T=Node routing table);

send a first data packet to the specified destination ("destination node is

reached", step 5, page 327; or LanuchForwardAnt(destination_node, source_node), line

13 of page 331);

receiving a second data packet from the specified destination; wherein the

second data packet is sent from the specified destination (suggested by "The backward

ant takes the same path as that of its corresponding forward ant, but in the opposite

direction", step 6, page 328)

updating the routing table based on information contained in the second data

packet (step 7, page 328; or UpdateLocalRoutingTable, line 26 of Page 331).

Caro discloses using trip time as parameter in routing table ("How to Score the

Goodness of the ant's Trip Time", Section 4.2, title and 1st paragraph, page 330), but

does not explicitly disclose that the path is the shortest in terms of delay time from a

source router to a destination router and the shortest amount of time is updated with

data packet travel to the specified destination.

In the same field of endeavor, RFC 2676 discloses OSPF extensions on routing

based on path QoS parameters (lines 1-5 of page 3). Since time delay (trip time) is one

of QoS parameters, it would have been obvious to one skilled in the art to use the

shortest time (delay time) as the criteria for the shortest path.

Therefore, it would have been obvious to a person of ordinary skill in the art at

the time of the invention to combine Caro with RFC 2676 to selecting a particular

neighbor router that has a lowest amount of delay time from source node to the

destination node in searching the best routing.

For **claim 9**, Caro discloses a method of updating a routing table (Node routing

table, page 331, line 6), the method comprising the computer-implemented steps of:

for each neighbor router in a set of neighbor routers predicted to be required for a

data packet to travel to a specified destination ("every network node", line 1 of step 1,

page 326), associating the neighbor router with an amount of time ("elapsed_time",

page 331, line 19; or step 2 of page 326);

receiving a forward ant data that indicates the specified destination (suggested

by "The backward ant takes the same path as that of its corresponding forward ant, but

in the opposite direction", step 6, page 328; or algorithm shown in page 331);

selecting, based on one or more first specified criteria (goodness of ant's travel

time, title and first paragraph of Section 4.2, page 330; or step 3 of page 327), a subset

of the set of neighbor routers (from page 331, line 14-20 where forward ant can only be

passed to neighboring routers one at a time; selecting from the routing table a subset of

neighbor routers through which paths to the destination go);

in response to receiving the forward ant data packet, selecting, from the subset

of neighbor routers, to the specified destination, among amounts of time associated with

neighbor routers in the subset of neighbor routers (the paths from the routing table are

updated based on received forward ant data packet, first paragraph of Section 4.2, page

330; or "updates the corresponding statistics and the routing table", step 7);

wherein the amount of time has been updated with a previous amount of actual

time taken for a previous data packet to travel to the specified destination ("step 7 i) of

page 328, where Mk that includes travel time information is updated based on previous

travel time of ants; or algorithm shown in page 331);

sending the forward ant data packet to the particular neighbor router ("destination

node is reached", step 5, page 327; or LaunchForwardAnt (destination_node,

source_node), lines 10-12, page 331);

receiving a backward ant data packet that indicates a second amount of time

taken for the forward ant data packet to travel to the specified destination ("The

backward ant takes the same path as that of its corresponding forward ant, but in the

opposite direction", step 6, page 328; the travel time is the second amount of time);

wherein the backward ant data packet is sent from the specified destination ("The

backward ant takes the same path as that of its corresponding forward ant, but in the

opposite direction", step 6, page 328);

determining, based on information indicated in the backward ant data packet,

whether one or more second specified criteria are satisfied (line 5-30 of page 331,

determining a path based on criteria specified in M=Local traffic model and T=Node

routing table); and

if the one or more second specified criteria are satisfied (a second time criteria

used to find proper path based on M and T; notice that criteria used for selecting paths

depend on user requirements and may have multiple values), then performing steps

comprising:

updating the first amount of time based on the second amount of time

(suggested by UpdateLocalTrafficModel, line 24 of Page 331; where traffic model is

updated); and

if one or more third specified criteria are satisfied (suggested by "The

backward ant takes the same path as that of its corresponding forward ant, but in the

opposite direction", step 6, page 328, which indicates the backward ant knows whether

the path taken by the forward ant is followed, which is equivalent to the path feasibility

flag), then updating, based on information indicated in the backward ant data packet,

the routing table (suggested by UpdateLocalRoutingTable, line 26 of Page 331).

Caro does not explicitly disclose selecting a particular neighbor router that is

associated with a first amount of time that is a lowest amount of time, but defines a

goodness in terms of trip time ("as estimated using the associated trip time", line 27-34

of page 329) that is used as a measure for determining routing between nodes.

In the same field of endeavor, RFC 2676 discloses OSPF extensions on routing

based on path QoS parameters (lines 1-5 of page 3). Since time delay is one of most

important QoS parameters, it would have been obvious to one skilled in the art to use

the shortest trip time (delay time) as the criteria for the shortest path.

Therefore, it would have been obvious to a person of ordinary skill in the art at

the time of the invention to combine Caro with RFC 2676 to selecting a particular

neighbor router that has a lowest amount of delay time from source node to the

destination node in searching the best routing.

As to **claim 10**, Caro in view of RFC 2676 discloses the method of Claim 9, wherein the one or more first specified criteria comprise a criterion that no neighbor router in the subset of neighbor routers is contained in a list of routers that have already been visited by the forward ant data packet ("choosing among the neighbors it did not already visit", line 1-2 of page 327).

As to **claim 11**, Caro in view of RFC 2676 discloses the method of Claim 9, Caro further discloses the method comprising:

determining whether any neighbor router in the set of neighbor routers is associated with an amount of time that is lower than the first amount of time ("as estimated using the associated trip time", line 27-34 of page 329); and

if any neighbor router in the set of neighbor routers is associated with an amount of time that is lower than the first amount of time, then updating the forward ant data packet to indicate a present router in a loop-avoidance router field of the forward ant data packet (cycle avoidance, step 4 of page 327, line 1-3).

As to **claim 12**, Caro in view of RFC 2676 discloses the method of Claim 11, Caro further discloses wherein a loop-avoidance router field ("memory of their paths and of the traffic conditions found", lines 1-2 of step 2 in page 326) of the backward ant data packet indicates a router indicated by the loop-avoidance router field of the forward ant data packet (notice that a backward ant packet has the same structure as forward ant packet).

As to **claim 13**, Caro in view of RFC 2676 discloses the method of Claim 12, Caro further discloses wherein the one or more second specified criteria comprise a criterion ("trip time", line 10 of page 329) that the router indicated by the loop-avoidance

router field of the backward ant data packet is not contained in a list of routers that the

forward ant visited after visiting a present router (step 3 of page 327, line 1-2; notice that

a backward ant packet has the same structure as forward ant packet).

As to **claim 14**, Caro in view of RFC 2676 discloses the method of Claim 9, but is

silent on wherein the one or more specified criteria comprise a criterion that the second

amount of time is lower than any other amount of time, relative to the specified

destination, among amounts of time associated with neighbor routers in the set of

neighbor routers.

However, the criterion that the second amount of time is lower than any other

amount of time is used in OSPF (disclosed by RFC 2676) in determining the shortest

path in term of time.

Therefore, it would have been obvious to a person of ordinary skill in the art at

the time of the invention to specify criterion that the second amount of time is lower than

any other amount of time in order to find the shortest path.

As to **claim 15**, Caro in view of RFC 2676 discloses the method of Claim 9, but

are silent on the method comprising: determining whether a router from which the

backward ant data packet was received matches a router associated with the

destination in the routing table; and if the router from which the backward ant data

packet was received does not match the router associated with the destination in the

routing table, then updating a path feasibility flag of the backward ant to indicate that a

path taken by the forward ant is not feasible.

However, the method requires the forward ant packet and the backward ant

packet go through the same route (in opposite direction). If the backward ant packet

cannot following the same route as the forward ant packet, the ant packet will be destroyed according to Caro ("if an ant is forced to return to an already visited node, the cycle's nodes are popped from the ant's stack and all the memory about them is destroyed", step 4 of page 327). It is a common practice in the art that one way of destroying/delete a packet is to set a flag of the packet so that it can be destroyed at proper time or location (such as taught by Tarin, US 2001/0000536 A1, "deleted cells are marked by a flag", [247]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to set a flag of the received backward ant packet if routing information of the packet does not match the routing table of the router in order to comply with the protocol.

As to **claim 16**, Caro in view of RFC 2676 discloses the method of Claim 15, Caro further discloses the one or more third specified criteria comprise a criterion that the path feasibility flag of the backward ant indicates that the path taken by the forward ant is feasible (suggested by "The backward ant takes the same path as that of its corresponding forward ant, but in the opposite direction", step 6, page 328, which indicates the backward ant knows whether the path taken by the forward ant is followed, which is equivalent to the path feasibility flag).

As to **claim 17**, Caro in view of RFC 2676 discloses the method of Claim 9, Caro further discloses the one or more third specified criteria comprise a criterion that a path taken by the forward ant data packet from a present router to the specified destination does not include any routers that are identified in a potential upstream node list (suggested by "The backward ant takes the same path as that of its corresponding

forward ant, but in the opposite direction", step 6, page 328, which indicates the

backward ant knows whether the path taken by the forward ant is followed, which is

equivalent to the path feasibility flag).

As to **claim 21**, Caro in view of RFC 2676 discloses the method of Claim 20,

Caro further discloses the stored sequences of instructions include instructions which,

when executed by the processor, cause the processor to further carry out: updating,

based on information contained in the second data packet, a path associated with both

the destination and the particular router ("updates ... the routing table", step 7, page

328-329 or UpdateLocalRoutingTable, line 26 of Page 331; the routing table includes all

the paths, including a path associated with both the destination and the particular

router).

As to **claim 22**, Caro in view of RFC 2676 discloses the method of Claim 20,

Caro further discloses wherein the stored sequences of instructions include instructions

which, when executed by the processor, cause the processor to further carry out:

updating, based on information contained in the second data packet ("updates ... the

routing table", step 7, page 328-329 or UpdateLocalRoutingTable, line 26 of Page 331),

an indication of an amount of bandwidth available ("characterized by a bandwidth", lines

10-11 of page 322) on the path taken by the second data packet (the path is disclosed

by "The backward ant takes the same path as that of its corresponding forward ant, but

in the opposite direction", step 6, page 328).

As to **claim 23**, Caro in view of RFC 2676 discloses the method of Claim 20,

Caro further discloses wherein the stored sequences of instructions include instructions

which, when executed by the processor, cause the processor to further carry out:

updating, based on information contained in the second data packet ("updates ... the

routing table", step 7, page 328-329 or UpdateLocalRoutingTable, line 26 of Page 331),

whether a path taken by the first data packet is feasible (suggested by "The backward

ant takes the same path as that of its corresponding forward ant, but in the opposite

direction", step 6, page 328; a mechanism that ensures the path is feasible based on

the updated routing table).

      As to **claim 24**, Caro in view of RFC 2676 discloses the method of Claim 20,

Caro further discloses wherein the stored sequences of instructions include instructions

which, when executed by the processor, cause the processor to further carry out:

updating, based on information contained in the second data packet, a list of routers

that indicates every router in a path taken by the first data packet from a router that sent

the first data packet to a present router (suggested by "The backward ant takes the

same path as that of its corresponding forward ant, but in the opposite direction", step 6,

page 328).

      As to **claim 25**, Caro in view of RFC 2676 discloses the method of Claim 20,

Caro further discloses wherein the stored sequences of instructions include instructions

which, when executed by the processor, cause the processor to further carry out:

updating, based on information contained in the second data packet to indicate an

amount of bandwidth available (routing table is "characterized by a bandwidth", lines 10-

11 of page 322) on the path taken by the second data packet (bandwidth available is

considered as a criterion of feasible path in algorithm specified in steps 1-7 of pages

326-330, which includes routing based on bandwidth).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jianye Wu whose telephone number is (571)270-1665.

The examiner can normally be reached on Monday to Thursday, 8am to 7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Seema Rao can be reached on (571)272-3174. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

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system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jianye Wu/

Examiner, Art Unit 2462

/Kevin C. Harper/

Primary Examiner, Art Unit 2462